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STATE NATURAL RESOURCES
CURRENT NO. 8
DATE 4-10-07
BILL NO. HB 831

Overview of HB 831 in its Current Form
by
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I am both an engineer and a geologist with four college degrees. My advanced degrees all involve the speciality of ground water. I have been reviewing the evolution of the water bills including bills HB104, HB 138, HB 831 and HB 844 over the last few months. I personally have several concerns about the bill that remains, HB 831.

Prior to discussing my concerns and how those concerns can be addressed, here are my qualifications:

- Over 30 years of ground-water experience including employment with the Montana Bureau of Mines and Geology, Montana State University, and the University of Nebraska-Lincoln. Over the last 20 years I have been a consultant specializing in ground water serving a variety of interests including City of Bozeman, private interests including development as well as environmental advocacy entities.
- I have completed sixteen regional ground-water modeling efforts which include surface water and ground-water interaction. I have also created numerous local-scale ground-water models.
- I have extensive experience in studying the surface water and ground-water resources of the Gallatin Valley. I have developed two separate ground-water models in the valley. One of these was for the City of Bozeman involving the Bozeman Solvent Site, the other in the vicinity of Four Corners. I am now in the process of creating a valley-wide surface water/ground-water model which will allow consideration and testing of a variety of water management options, including the relative significance of changes in irrigation use, ground-water development practices as well as the implications of drought, etc..

What the Data Show

Owing to my concerns and the concerns of others regarding earlier bills, HB 104 and HB 138, I conducted a detailed hydrologic evaluation of the Gallatin Valley watershed as well as more cursory studies of other watersheds in Montana in high growth areas. Based upon my evaluation of the data, there is no evidence of impacts from ground-water development on stream-flows in the Gallatin Valley or these other watersheds. The primary reason for this observation is that unless the amount of irrigated land acreage is increased via ground-water development, and hence, consumptive use is increased accordingly, stream flows are unlikely to be substantively affected. Ground water is typically used to either irrigate new land, replace surface water irrigation, or to supplement surface water irrigation sources. In many instances, land that had been formerly irrigated with surface water is no longer irrigated at all and remains in streams. The key is to conduct the "addition" and "subtraction" or complete the overall watershed

water balance to determine if there will be significant impacts as a result of the transitions that are occurring.

Comparing the Montana situation to other states, and then extrapolating what happened in other states to Montana issues is simply invalid unless the conditions in other states match the conditions in Montana. In the Gallatin Valley situation, my detailed evaluation of irrigation mapping and infrared imagery suggests that the amount of irrigated acreage is declining. Hence, it does not make any sense from a scientific perspective to claim that ground-water development has negatively impacted streams in the Gallatin Valley.

The basic premise that it is necessary to globally use aquifer recharge or stream-flow mitigation is not founded on the basis of the data. In summary, the main reason for reduced stream-flows in the valley and in other portions of Montana is drought. The proponents of the proposed legislation did not consider the significance of drought in the Gallatin Valley and in other portions of Montana. In fact, I have seen little evidence that proponents of the legislation have ever thoroughly evaluated the existing surface water flow data, ground-water level data, and the climatic data influencing the Gallatin Valley. In my opinion, legislation without foundation and without data evaluation should be developed with extreme caution. Otherwise, a whole new set of problems may result.

Basis for Treating Waste-water to Safe Drinking Water Standards

There is no reasonable technical basis to conclude that it is necessary to treat waste water to Safe Drinking Water Act (SDWA) standards before the water can be used as a recharge source. This is what Section 19 of the HB 831 promotes. My discussions with other experts who actually do waste-water treatment design (as opposed to review work) is that this is not being done anywhere in Montana or in the United States. Rather, water is treated to the level necessary so as not to degrade either ground water or surface water. This is what is done in Montana and enforced by the Montana Department of Environmental Quality, not DNRC.

What is really key to water resources permitting is the amount of water that is contributed back to the aquifer as part of the overall water balance. The water balance portion is the domain of the DNRC. Waste-water quality issues are the domain of the Montana Department of Environmental Quality (DEQ), not DNRC. Waste-water quality issues should be kept in the domain of DEQ and not placed in the domain of DNRC.

There is no basis to include Section 19 in HB 831. As a result, there is no basis to include a water quality report and water quality studies that are promoted in Section 15 and cited in other sections of the bill as well.

Technical Feasibility of Aquifer Recharge/Mitigation

Section 16 is problematic from an implementability perspective. The use of aquifer recharge and even mitigation will prove to be limited or impossible in many areas of Montana. For instance, geologic conditions must be very favorable or ideal to allow for the implementation of aquifer recharge. In many, if not most instances, aquifer recharge simply will not work. For instance, much of the Big Sky area, where I have conducted a significant amount of work, has shallower strata consisting of clays, siltstones and shale which do not allow use of surface recharge methods. The water will not percolate through such "tight" strata at meaningful flow rates.

Mitigation with surface water also has serious technical limitations. For instance, there is no history of significant surface water irrigation in the Big Sky area (e.g., Gallatin Valley side) which would allow the use of offsetting a "net-depletion" by mitigation. This yields an implementability problem for both mitigation and aquifer recharge.

There is much more to this than what is described above. It is not practical to discuss all the technical problems in this brief overview. In general, the overall water permitting process will be greatly complicated with the legislation that is proposed. It is already a complicated and controversial process. It does not need to be made any more complicated than it already is. That is what will transpire with the requirements set forth in Sections 15 and 16. Currently, I let my potential clients know in advance that the process is very arduous, time-consuming and expensive. There are no guarantees of the outcome simply because of the existing requirement to demonstrate that no senior appropriator is adversely impacted. This is in spite of the fact that most stream-flow and ground-water level data do not show the types of purported impacts claimed by the HB 831 proponents.

Finally, the bill as written will have the unintended consequence of encouraging more development in riparian areas where water is available for mitigation and aquifer recharge. Moreover, aquifer recharge is much more likely to be technically feasible in alluvial valleys as well. Thus, just the opposite goal of the proponents of the bill is likely to occur. There is likely to be more development next to streams under the current bill formulation.

Municipality versus Municipal Use

The language for exemption limiting it to municipalities is not well thought out. We should be encouraging public water supply development, even in rural subdivisions, as opposed to using exempt wells. In effect, the proposed bill will encourage more dependence upon exempt wells rather than public water supply systems. This will be further confounded if the proposed water quality legislation is imposed. It is my recommendation that the term "municipality" be universally replaced with the wording "public water supply systems."

Case Study

The case study (studies) process is not well conceived. Case studies will not provide a substantive contribution to understanding the potential significance or lack of significance of overall water-use transitions at a watershed scale. Watershed scale studies using the existing database need to be performed to answer the questions that need to be answered.

The type of study that is needed should include, at a minimum, the following components:

- Evaluation of the long-term ground-water level data currently being collected by the Montana Bureau of Mines and Geology (MBMG).
- Evaluation of the U.S. Geological Survey (USGS) Stream-flow data,
- Evaluation of climatic data including SNOTEL and precipitation data, and
- Quantification of the changing land use practices (e.g., irrigation practices, etc.).

The above "long-term" data should be evaluated at a watershed or subwatershed scale to determine if there is any evidence of the so-called "cumulative impacts" that some believe have occurred.

It would be my recommendation that the watershed study effort be scoped by a team comprised of a regulator (e.g., DNRC), an academician (e.g. MBMG or MSU), a consultant with hydrologic/hydrogeologic/water permitting expertise representing industry and a consultant that understands and can represent the interests of environmental advocacy entities.

Again, my experience and efforts involving the Gallatin Valley work which evaluated data from the 1930s to the present indicated no evidence of the "cumulative impacts" that are claimed by some entities. In the case of those who claim the existence of cumulative impacts, I have not seen where they have conducted the types of evaluation using the above data that are necessary to support their conclusions.

It is my recommendation that the Montana Bureau of Mines and Geology be queried as to the type of program that needs to be done. Should case studies be performed or should watershed studies be done? In my opinion, by far the best option is to evaluate the existing data as there is likely enough data to answer the questions that need to be answered. In the event that data gaps are identified, then these can be dealt with and addressed accordingly by the team of experts described heretofore. Note that the type of watershed studies that are necessary is akin to what I completed in a report entitled

"Gallatin Valley Water Resources Evaluation" by Nicklin Earth & Water, Inc., January 2007.

Summary

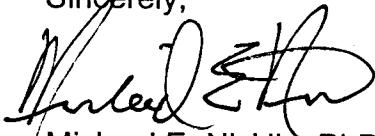
In summary, I would recommend either one of the following:

- 1) Do not pass this legislation; or
- 2) At a minimum:
 - Remove Section 19
 - Remove Water Quality Report requirements defined in Section 15. Remove all other references to water quality requirements other than those currently under the statutory authority of DEQ.
 - Conduct evaluations of watersheds using water balance methods which consider existing ground-water level data, stream-flow discharge data and land-use transition trends. These studies should be performed to determine "what is really happening" before requiring the mitigation and aquifer recharge legislation as set forth in HB 831.

My overall concern is that the process for obtaining a beneficial use permit is already too complex. Passing the above legislation as is will make the permitting process untenable.

If you have any questions, please feel free to call me at 406-582-0413.

Sincerely,



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